

ABSTRACT

A frequency translating device (FTD) includes at least one light-activated resistor (LAR) connected to down-convert a radio frequency (RF) to an intermediate frequency (IF) and to up-convert an IF to an RF and a source of modulated light that is optically connected to the LAR. The source of modulated light is modulated in response to a local oscillator (LO) and the LAR is activated in response to the modulated light. Modulated light can be generated from a light source and an LO by, for example, directly modulating the light source, modulating a transmission switch that blocks the transmission of light to the LAR, or modulating a light path switch. The LAR-based FTD can be used as a reciprocal FTD to characterize another FTD in a three-pair measurement system. An FTD may include more than one LAR to form, for example, single-balanced and double-balanced LAR-based FTDs.